Chunhui (Charles) Liu

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Education

Carnegie Mellon University, Robotics Institute — Pittsburgh, PA
Master of Science in Computer Vision — *Aug. 2018 - Dec. 2019*

Peking University, School of Electronics Engineering and Computer Science — Beijing, R.P.China
Bachelor of Science in Computer Science, Summa Cum Laude — *Sep. 2014 - Jun. 2018*

- Department GPA: 3.59/4.0 , Cumulative GPA: 3.54/4.0

Publication

[1] **Conference Paper**: Temporal Perceptive Network for Skeleton-Based Action Recognition
Yueyu Hu, Chunhui Liu, Yanghao Li, Sijie Song and Jiaying Liu — In BMVC 2017

[2] **Conference Paper**: Online Action Detection and Forecast via Multi-Task Deep Recurrent Neural Network
Chunhui Liu, Yanghao Li, Yueyu Hu, Jiaying Liu — In ICASSP 2017

[3] **Conference Paper**: PKU-MMD: A Large Scale Benchmark for Skeleton-Based Human Action Understanding
Chunhui Liu, Yueyu Hu, Yanghao Li, Sijie Song, Jiaying Liu — In ACM Multimedia W 2017

[4] **Preprint Paper**: Patch Correspondences for Interpreting Pixel-level CNNs
Victor Fragoso, Chunhui Liu, Aayush Bansal, Deva Ramanan — Arxiv Preprint 1711.10683

[5] **Patent**: A Multi-Task Deep RNN Model for Online Action Detection and Forecast.
Chunhui Liu, Yanghao Li, Yueyu Hu, Jiaying Liu, Zongming Guo — CN201710146933.5

Experience

Research Assistant
Institute of Computer Science and Technology, Peking University
Advisor: Jiaying Liu, Associate Professor, Peking University — *Feb. 2016 - Jul. 2018*

(1) Large Scale Action Recognition on 3D Skeleton Data (Publication [1])
- Proposed a LSTM-based Temporal Perceptive Network with short-term kernel to capture detailed action feature in skeleton data. <Coded in Python on Keras architecture>
- Achieved $\sim 3\%$ accuracy improvement on NTU dataset, $10\% - 20\%$ improvement on smaller datasets.
- **Ranked #1** in *ACCV 2016 workshop - Large Scale 3D Human Activity Analysis Challenge in Depth Videos*

(2) Online Action Detection and Forecast on 3D Skeleton Data (Publication [2][5])
- Proposed an on-line LSTM-based deep network to detect action intervals and forecast action occurrences synchronously on skeleton data. <Coded in Python on Lasagne architecture>
- Achieved average error in $3 - 5$ frames, proposed first frame-level forecast networks on skeleton data.

(3) Large Scale Multi-Modal Action Benchmark and Workshops (Publication [3])
- Built largest multi-modal action dataset for skeleton-based action understanding with benchmarks for cross-view and cross subject evaluation . <Coded in Python, Data collected by Kinect>
- Used for *IEEE ICME 2017 workshop - Large Scale 3D Human Activity Analysis Challenge in Depth Videos*.

Research Intern
Robotics Institute, Carnegie Mellon University
Advisor: Deva Ramanan, Associate Professor, Carnegie Mellon University — *Jun. 2017 - Sep. 2017*

(1) Visualizing and Interpreting Convolutional Neural Networks (Publication [4])
- Proposed a pixel-wise non-parametric method to interpret pixel-wised CNNs based on Compositional Nearest Neighbors. <Coded in Python on Tensorflow architecture>
- Provided a new perspective on high-level deep feature space by reconstructing input and output images for pixel-level tasks (e.g., image synthesis and segmentation).

Skills

Deep Learning Tools	TensorFlow, Keras, Lasagne, *Theano*, *Caffe*
Programming Languages	C/C++(8 years, ∼50k lines), Python(3 years, ∼5k lines), HTML, JavaScript, Lisp
Projects	Operating System Labs on Android , MiniJava Compiler
TA Experiences	Practice of Programming in C&C++, Algorithm Design and Analysis

Honors and Awards

Outstanding Graduate Award of Beijing	2018
Third Prize in Peking University ACM Competition	2017, 2016, 2015
Peking University Award for Outstanding Student	2017, 2016
Meritorious Prize, the Mathematical Contest in Modeling (MCM)	2016
Peking University Award for Excellence in Scientific Research (2%)	2015